

## Viewpoint

### Supreme Court judgment on polygraph, narco-analysis & brain-mapping: A boon or a bane

#### Introduction

The deception detection tests (DDT) such as polygraph, narco-analysis and brain-mapping have important clinical, scientific, ethical and legal implications<sup>1</sup>. The DDTs are useful to know the concealed information related to crime. This information, which is known only to self, is sometimes crucial for criminal investigation<sup>2</sup>. The DDTs have been used widely by the investigating agencies. However, investigating agencies know that the extracted information cannot be used as evidence during the trial stage. They have contested that it is safer than 'third degree methods' used by some investigators. Here, the claim is that, by using these so called, "scientific procedures" in fact-finding, it will directly help the investigating agencies to gather evidences, and thereby increase the rate of prosecution of the guilty and the rate of acquittal of the innocent<sup>3</sup>. Recently, these methods are being promoted as more accurate and best to none, without convincing evidence. In a landmark judgment, the apex court of India has clearly stated that DDTs cannot be administered without consent<sup>3</sup>.

#### Debate

The core debate arising out of the DDT is its legality of using inhuman degrading methods to confess the crime. The interrogation of the accused plays a vital role in collecting evidence. If the accused remains silent and does not answer any questions of the investigating agencies then to what extent the investigating agencies can coerce or force the accused to reveal information. In a civilized world police torture is unacceptable to extract information about the crime. Even in the court of law, confession made to a police officer is not valid. Now, the question is, "Can police use DDT to extract information from the accused"? There are many who support the view that in this age of ever increasing crime rate, such tests often help to the investigating

agencies but others rejecting it as a clear violation of constitutional provisions. This viewpoint looks into the earlier court's view, recent Supreme Court judgment and scientific basis of DDTs.

#### Earlier Judgments on DDTs

In a landmark judgment<sup>4</sup> the Madras High Court conveyed that investigating agency is required to complete investigation within a reasonable time, if not, the benefit of delay is given to the accused. If accused fails to co-operate with the investigation process undertaken during custodial interrogation, to unravel the mystery surrounding the crime, scientific investigation methods may have to be carried out to find the truth<sup>4</sup>.

Keeping the same spirit in another judgment, the court had held that the narco-analysis test is a step in aid of investigation<sup>5</sup>. It forms an important base for further investigation as it may lead to collection of further evidences. Therefore, with reference to the proliferation of crimes against society, it is necessary to keep in mind the necessity of the society at large and the need of a thorough and proper investigation as against individual rights while ensuring that constitutional rights are not infringed. Consequently, in the court's opinion, the narco-analysis test does not suffer from any constitutional infirmity as it is a step in aid of investigation and any self incriminatory statement, if made by the accused, cannot be used or relied upon by the prosecution. The court ordered the accused to undergo the narco-analysis test in stipulated period<sup>5</sup>. These judgments were clearly supporting the use of DDTs in investigations.

#### Recent Supreme Court judgment on DDTs

The Supreme Court judgment<sup>3</sup> on May 5, 2010 related to the involuntary administration of DDT for the purpose of improving investigation efforts in criminal

cases was questioned on the account of violation of fundamental rights such as:

(i) 'Right against self-incrimination' enumerated in Article 20(3) of the Constitution, which states that no person accused of an offence shall be compelled to be a witness against himself/herself, and

(ii) Article 21 (Right to life and personal liberty) has been judicially expanded to include a 'right against cruel, inhuman or degrading treatment'.

DDT also raises serious concerns related to the professional ethics of medical personnel involved in the administration of these techniques and violation of human rights of an individual<sup>3</sup>. Concerns regarding human rights violations in conducting DDTs were raised long back and the National Human Rights Commission had published Guidelines in 2000 for the Administration of Polygraph tests<sup>6</sup>. However, only few of the investigating agencies seen to follow these guidelines.

### Scientific evidence of DDTs

*Narco-analysis*: This test involves the intravenous administration of a drug (such as sodium pentothal, scopolamine and sodium amytal) that causes the subject to enter into various stages of anaesthesia. In the hypnotic stage, the subject becomes less inhibited and is more likely to divulge information, which would usually not be revealed in the conscious state. He or she may also divulge all his/her fantasies, personal wishes, impulses, instinctual drive, illusions, delusions, conflicts, misinterpretations, *etc.* The main drawback of this technique is that some persons are able to retain their ability to deceive even in the hypnotic state, while others can become extremely suggestible to questioning. This is especially worrying, since investigators may frame questions in a manner that may prompt incriminatory responses. The drugs used do not guarantee that the subject will speak only the truth. The statements made in a hypnotic state are not voluntary and are also not in a clear state of mind; hence these have not been admitted as evidence in the court of law. Narco-analysis "without consent" raises certain issues such as (i) a physical assault on the body by giving injections and also multiple painful stimuli such as slapping, pinching, pushing, hitting, shaking the body and so forth to wake a person from hypnotic state to answer the questions, and (ii) mental assault through the effect of the injection on his/her mind and also an unrestricted access to the utmost privacy, the privacy of his/her own mind. In the era of evidence-

based medicine, it does not have any significant role in the treatment of any psychiatric conditions. Though this technique is known since the Second World War<sup>7</sup>, it has not been supported with adequate research to justify its claim.

*Polygraph*: This is also called a lie detector test, but this term is a misnomer. The theory behind polygraph tests is that a guilty subject is more likely to be concerned with lying about the relevant facts about the crime, which in turn produces a hyper-arousal state which is picked up by a person trained in reading polygraph results. Measurement of hyper-arousal state is based on a number of parameters such as heart rate, blood pressure, respiratory rate, skin conductance and electromyography. The principle behind these tests is questionable because the measured changes in arousal state are not necessarily triggered by lying or deception. Instead, these could be triggered by nervousness, anxiety, fear, confusion, hypoglycaemia, psychosis, depression, substance induced (nicotine, stimulants), substance withdrawal state (alcohol withdrawal) or other emotions. This state has also been attributed to the way the questions are asked by the investigating officers. At the same time, it is not difficult to beat polygraph tests by a trained person, who is able to control or suppress his/her arousal symptoms through relaxation exercises, Yoga, meditation, *etc.* Hence, the reliability of the polygraph test has been repeatedly questioned in empirical studies.

*Brain mapping*: It measures the changes in the electrical field potentials produced by the sum of the neuronal activity in the brain by means of electrodes placed on the surface of the skin covering the head and face. The changes directly related to specific perceptual or cognitive events are called event-related potentials<sup>8</sup>. In simple words, it is based on the finding that the brain generates a unique brain-wave pattern when a person encounters a familiar stimulus<sup>9,10</sup>. Commonly used method in India is called as Brain Electrical Activation Profile test, also known as the 'P300 Waves test'.

During the test, subjects are exposed to auditory or visual stimuli (pictures, videos and sounds) that are relevant to the facts being investigated alongside other irrelevant words and pictures. Such stimuli can be broadly classified as material 'probes' and neutral 'probes'. The underlying theory is that in the case of guilty suspects, the exposure to the material probes will lead to the emission of P300 wave components which will be duly recorded by the instruments. By examining the records of these wave components, the

examiner can make inferences about the individual's familiarity with the information related to the crime<sup>3,11</sup>. However, this measures only the memory or knowledge of the crime scene and nothing else. For instance, a bystander who witnessed a murder could potentially be implicated as an accused if the test reveals that the said person was familiar with the information related to the same. Similarly, little is known about the impact of viewing portrayal of crime scene in the media such as television, movies and newspaper on brain mapping. Hence, this test cannot be used to prosecute an accused but can be used by an innocent as an 'alibi' by proving that he/she does not have any memory about the crime on this test.

The published literature on this technique is very sparse. The term 'Brain Fingerprinting' has not yet entered the Medical Sub-Headings (MeSH) term of -PubMed (Medline). On conducting a literature search in PubMed by combining two MeSH terms "Event-Related Potentials, P300" and "Forensic Medicine" yielded only 23 publications and another PubMed search by combining two MeSH terms "Brain Mapping" AND "Forensic Medicine" (1966-June 2011) yielded only 72 publications. On reviewing this published literature, it was found that results were inconclusive. The sample sizes were small. Majority of the studies were open label and with poor methodology. Sample studied were from the normal population rather than forensic population. Each study has used a different protocol to interpret the data. There was one interesting study which reported that deception detection based on P300 amplitude as a recognition index may be readily defeated with simple countermeasures that can be easily learned<sup>12</sup>. Non availability of data on the effect of brain wave mapping on neurological conditions (such as stroke, dementia, delirium, head injury, amnesic syndromes, etc.) and psychiatric conditions (such as substance intoxication or dependence conditions, schizophrenia, mood disorders, anxiety disorders) makes matters worse. There is a paucity of data on this technique, and applicability of this technique in the forensic field is remote at this point of time<sup>9,10</sup>. There are several ongoing research studies using functional brain imaging studies in the field of brain mapping, however, results from these studies are also inconclusive and researchers have recommended that the functional brain images in brain mapping also should not be admitted as evidence in the court of law<sup>13</sup>.

In conclusion, DDT has faced a number of criticisms and it is still unclear to what degree lie

detectors and brain mapping can be used to reveal concealed knowledge in applied real-world settings. The Supreme Court judgment on involuntary DDTs is that it has no place in the judicial process. On the contrary, it will disrupt proceedings, cause delays, and lead to numerous complications which will result in no greater degree of certainty in the process than that which already exists<sup>3</sup>. Contemporary DDT needs to undergo rigorous research in normative and pathological populations. Premature application of these technologies outside research settings should be resisted. The vulnerability of the techniques to countermeasures also needs to be explored. It is also important to know the sensitivity and specificity of these tests. There should be standard operating guidelines for conducting DDT. The recent Supreme Court judgment on DDT is admirable from the scientific, human rights, ethical, legal and constitutional perspectives.

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